

The Paradox of Sustainability Definitions

Journal:	<i>APIRA CONFERENCE</i>
Manuscript ID:	APIRA-2010-073
Manuscript Type:	Paper Submission
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Abstract:

Purpose: This paper aims to encourage debate and reflection over the increasing application of the word *sustainability* and the implied meanings taken from this usage. It is argued that there are increasing numbers of sustainability definitions which are producing negative effects; that the interpretation and dissemination of sustainability definitions are not neutral in their effects of understanding sustainability.

Design/Methodology/Approach: This paper examines how sustainability is conceptualised from two worldviews and by specifically looking at four different convening parties; how their dimensions of sustainability are linked, influence and drive the construction of the sustainability definitions in a variety of arenas and in the public domain.

Findings: This research has identified that the paradox of sustainability definitions lies in the parties who create them and not in the issues of sustainability; that often sustainability definitions do not share the same goals.

Practical Implications: This paper seeks to bring the increasing surfeit of sustainability definitions under scrutiny and therefore extend possibilities of further research in the areas of social responsibility, ethics, claims of professionalism and accountability.

Originality/Value: There has been little if any research that questions the validity of the sustainability definitions and how they address the issues of sustainability. It shows that the sustainability definitions can affect and shape the understanding of sustainability in a variety of arenas and for a variety of parties.

Keywords: Sustainability, definitions, worldviews,

Article Type: Research Paper

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2010

The Paradox of Sustainability Definitions

Introduction:

There is an ever increasing surfeit of sustainability definitions that exist in academic literature, the media and the public arena reflecting in a multitude of ways that the concept of sustainability is used. Sustainability is a term that evokes highly charged reactions across intellectual and academic disciplines; furthermore a heterogeneous collection of commentators and analysts have also seized upon the term. The myriad of sustainability definitions weave together threads of fact and theory along with concepts of justifications. Some have historical primacy while others hold intuitive moral appeal (Cheney, Nheu & Vocellio, 2004).

Without doubt when the Brundtland Report released its definition of ‘sustainable development’¹, a modern crusade was born (Sachs, 1993). The Brundtland sustainability definition is often the starting point of many sustainability articles (Wilkinson, Hill & Gollan, 2001; Williams & Millington, 2004). Significantly the utility of the term ‘sustainability’ seems illimitable. ‘Sustain’, ‘sustainability’, ‘sustainable development’, and ‘sustainable’ are all terms that are rarely defined, are problematically set up as a condition to attain, soberly measured or alternatively promoted. These terms are equally set up as conditions that can be criticised, dismissed or rejected. Sustainability is a highly loaded term, so much so, that few if any disciplines can avoid having a view; some have committed ‘for’, others ‘against’ whilst the remainder are simply just sitting on the fence between (Lele & Norgaard, 1996; Yanarella & Bartilow, 2000). Furthermore it is not uncommon to find that scientific, political and symbolic interpretations of sustainability are being used interchangeably within some disciplines; identifying the integrated nature of sustainability discourse (Dodds, 1997).

Yet in the case of the word *sustainability*, not only is there no agreed and accepted definition, there also seems to be a resistance to any attempt to determine one (Fowke & Prasad, 1996). It is the existence of the pluralism and interdisciplinary struggle of sustainability definitions that makes it clear that the very different definitions may be counter-hegemonic; what has evolved is a generic use of the term (Palmer, 2003). As the number of sustainability definitions continue to increase there is little if any research that explores the foundations of the definitions, and asks whether they stem from a common origin or even whether they seek to achieve the same goals. Sustainability definitions range from the rhetoric to reality; whether they elucidate a common concern or whether they identify a critical issue – it is not always clear what exactly is being sustained.

This paper seeks to encourage debates about the increasing application of the word *sustainability* and the implied meanings taken from this usage. Many academics simply accept without question that there is no one universal definition that fits sustainability; few would believe that the lack of a definition severely hampers the understanding of sustainability and therefore limits the ability of societies to address the important problems of sustainability or to

¹ “Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission for Environment and Development, 1987, pp. 8).

capitalise on the opportunities that sustainability presents (Howarth, 1997). If the validity of the sustainability definitions can be ascertained then the issues of sustainability are addressed; the alternative is blind acceptance without questioning the definitions which risks false optimism (Lele, 1991).

In particular, this paper seeks to encourage reflections on the value-laden foundations of sustainability which are rendered variable and often questionable by the increasing myriad of sustainability definitions. Sustainability can have different definitions depending on which user and in what context it is being used (Yanarella & Bartilow, 2000). The diversity of sustainability definitions, it is argued, should be a point of strength rather than a point of weakness – sustainability speaks of a globally shared paradigm (Cairns, 1997). The definitions shape the understanding of sustainability in the public arena and therefore responsibility and accountability should attach accordingly. Largely left unexamined is the responsibility of those who are defining sustainability, for the interpretation and dissemination of sustainability definitions are not neutral in their effects of sustainability understanding.

This paper is divided into three further sections. The next section explores the two schools of thought that conceptualise sustainability, i.e. sustainability well-being and sustainability evolution, and which drive the definitions. Evidence is provided that these two different views correspond to what the parties believe the world is like and what it should be like. Parties use either of these worldviews to orientate themselves, as a guide to the conceptualisation of sustainability. Significant to the party's orientation toward sustainability is the foundations of knowledge that are being used to determine sustainability and how this influences which sustainability issues are championed by parties.

The following section provides a framework for appreciating how taxonomies are taken into account and developed. Classification and counter-classifications not only differentiate the phenomena that are being classified – but the process of classification also ranks the classifications (Lincoln, 1992, pp.7). Lincoln (1992) declares that 'knowers do not and can-not stand apart from the known' (pp. 7), and 'taxonomy is thus not only an epistemological instrument (a means of organising information) but it is also (as it comes to organise the organiser) an instrument for the construction of society' (p.8). This paper looks specifically at four different convening parties², their dimension of sustainability together with their actions, their strategies and the necessity of collaboration between the convening parties and how this influences their construction of sustainability definitions. The final section summarises the paper and discusses its significance and the implications for further research.

Conceptualisation of Sustainability: An Evolutionary Process or a State of Well-being?

Sustainability literature has followed two distinct yet alternate philosophical assumptions that underpin the sustainability definitions; a dichotomy inherent within sustainability definitions

² (1) science (scientific) dimension, (2) political dimension, (3) economic dimension and (4) indigenous dimension – see p.10

that alternate between sustainability as a state of *well-being* and sustainability as an *evolutionary process*. The difference between the two perspectives is marked by on-going debates about what sustainability requires as a natural outcome of carefully reasoned justifications and pragmatic knowledge. Both worldviews are expressed as a *belief* element and a *normative* element; both worldviews are epistemologically significant (Odera Oruka, 1985).

The first posits sustainability as a state of well-being; a deep-rooted belief that humans can live in a harmonious coexistence with the natural world (Dodds, 1997; Dasgupta, 2004, p. 15). The definitions of well-being sustainability focus on the basic requirements for good health, (cultural) identity, personal security and freedom of choice (Dasgupta, 2004, pp. 16; Diaz, Fargione, Stuart Chapin, & Tilman, 2006). Controversy about the normative meanings of these terms and to whom these terms apply abounds; determining the thresholds of 'well-being' and who has the right to determine the thresholds further complicates well-being sustainability. The sustainability knowledge of how man interfaces and links to the rest of the world is largely incomplete; the knowledge and sustainability know-how phenomena pertains to causal connections that are not yet fully understood (Lele & Norgaard, 1996; Diaz, Fargione, Stuart Chapin, & Tilman, 2006).

Contrary to ordinary expectation, sustainability well-being has made us aware of, if not the impossibility, of trying to establish exactly what the foundational values of sustainability well-being are. Is it restricted to the health and conditions for man alone or is well-being extended to include the others? If the well-being definitions of sustainability are construed to meeting the core needs of humans, then normative definitions of sustainability from this viewpoint are tendered with notions of security of individual/community health together with financial security; the planet is regarded as a resource to further this end (Anand & Sen, 2000). If however well-being definitions of sustainability are construed to preserving and protecting the environment as well as biodiversity of other species (plant and animals) then the normative definitions of sustainability from this viewpoint are tendered with notions of global environmental stability, ecological considerations and security of ecosystems (Bishop, 1993; Lele & Norgaard, 1996).

From this worldview arguably the sustainability definitions are criterial rather than definitional; finding an adequate definition of sustainability is problematic if only because the different parties will set up rival criteria from which they determine their ideal of sustainability. Dasgupta (2004) promulgates that the notions of sustainability well-being presents as a comprehensive societal aggregate of human rights and obligations that are underpinned by theories of social justice (pp. 20); this is reiterated by Anand & Sen (2000) and captured by the Brundtland Report when it speaks of intergenerational equity. Therefore this worldview of sustainability is marked not by a characteristic system of fixed beliefs, but by a system of unfixed beliefs because of the inherent contradictions of the definitions posited by each party.

The second alternative worldview that underpins sustainability definitions posits that sustainability exists as an 'evolutionary process'. Sustainability from this viewpoint becomes a continuous learning process of creating and testing so that new knowledge is combined and re-developed and recombined; what results is evolutionary gains in sustainability definitions rather than a defined model state of sustainability (Ring, 1997). This approach to sustainability declares that the newer, more recent, sustainability definitions should be more complex than the older definitions; driven by the revelation of knowledge, sustainability in response becomes more sophisticated over time (Bagheri & Hjorth, 2007).

Bagheri & Hjorth (2007) assert that sustainability from the evolutionary viewpoint can only be defined as continuous development and learning of sustainability. There cannot be an ideal state of sustainability (pp. 84-85). Instead sustainability learning provides a feedback pathway (Bagheri & Hjorth, 2007). This hierarchical classification determines that the cumulative changes in sustainability knowledge that have occurred over time often show that sustainability definitions have been recombined or manipulated resulting in a taxonomic structure. Each taxonomic branch takes on its own significance and meaning; the more branches the 'sustainability definitional tree' possesses establishes the existence of the various distinct expressions of sustainability – yet also establishes that taxonomic branches also shared a common definition in its past evolutionary history (adapted from Simpson, 1961, pp. 11). From this worldview – the definition of sustainability is constantly verified; old knowledge is reviewed and is adjusted as new knowledge becomes available.

Which ever model sustainability takes – a common complicating factor to both models is the link between sustainability and justification; each definition of sustainability is often evaluated by the appeal to the role it will play by each party. As the warranted justifications of a party's actions increase – each party has better reason to believe that their definition of sustainability is the correct version; the downside is that the demarcation between justification and definition become blurred (adapted from McGrew, 2002). It is from this viewpoint that the definitions of sustainability become divergent; reiterating the resistance to determine one reconciled definition of sustainability.

Identifying and Classifying Sustainability Definitions

By necessity the conceptual structure of sustainability is multi-disciplinary. Those who have the power to shape both society and the natural environment also have the power to shape how sustainability is conceptualised, organised, and actioned; earth scientists, politicians, economists, among others, have all contributed to shape sustainability and therefore each party brings its own characteristic inflection of subject matter and method of sustainability. Sustainability demands the crucial importance of recognising multiple issues and the ensuing multiple viewpoints within a modern society.

Notwithstanding the differences between the different parties in sustainability, there also exists an overlap among them that is often substantial and therefore the dialogue is almost organic rather than academic; the definitions inadvertently identify the issues of sustainability. More importantly each sustainability definition implies that it is unitary, that knowledge exists that can alleviate a non-sustainable condition; yet to talk of achieving sustainability requires an understanding of the interconnectedness of sustainability issues.

The convening parties of sustainability are not limited to those with political power; this power is only one of many and various kinds of power – such as that of economic, financial, industrial and military. More importantly power has been long associated and intimately linked to influence, eminence, competence, knowledge dominance, rights, force and authority (Bierstedt, 1950, pp. 730). The type of power held by the party has relevance to how sustainability is defined.

The more recent sustainability initiatives taken up by ordinary communities suggest that there are particular factors that are more likely to influence the potential success and the

outcomes of sustainability initiatives in predictable ways (Brodscholl, 2003). Within communal forums emerge threads that define clusters of parties with a shared sustainability foundational value; a conceptual stream in the sustainability definitions emerges with each thread. Clarity in identifying these different threads and how they are related can help maintain the philosophy of the concept but it is also useful in identifying how the threads of the sustainability definitions are also corrupted and that as a result of this corruption it is unlikely that the varied definitions of sustainability will be reconciled (adapted from (Chatterjee & Bhattacharjee, 1971). This paper looks specifically at four different convening parties and how they construct their definitions; (1) science (scientific) dimension, (2) political dimension, (3) economic dimension, and (4) indigenous dimension.

Scientific Dimension of Sustainability

Science is at the heart of these sustainability definitions – specifically Earth system science (Clark, Crutzen & Schellnhuber, 2004, pp.14). Crutzen (2002) coined the term ‘anthropocene’ to describe the current period of Earth’s history; where the actions of human have become a significant force in reshaping the Earth’s life support systems. Much of the scientific basis for Earth system science is founded on the works of firstly pre-Socratic Greek philosophers and scientists, who lived pre-380 B.C; and later Galileo, and Italian philosopher and scientist, who live in the 16th century (Grove, 1990, pp. 15-19). Early philosophers and scientists from the antiquities viewed the world as a “balance” of nature; this was the principal basis for the interaction and relationships between plants, animals, the environment and humankind (Grove, 1990, pp. 19; Manzier, 1996, pp. 82). Earth science studies the planet as a ‘whole’ and synthesises together the disciplines of geology, meteorology, oceanography, geophysics, geochemistry and palaeontology; the focus is the sciences’ understanding of each aspect from a global perspective. Earth science grounds sustainability as a global concept; if only because the work of the earth scientist is global in nature (Hamblin, 2005, pp.157; Kennedy, 2006, pp. 102).

From this viewpoint sustainability is therefore the protection and well-being of the living planet; the preservation and protection of the earth’s natural cycles, the preservation and the protection of the millions of species of plants and animals, including humankind, from the destructive forces of anthropogenic manufacturing processes, technologies and human populations (i.e. Earth Science) (Sachs, 1993; Cash, Clarke, Alcock, Dickson, Eckley, Guston, Jager & Mitchell, 2003).

While Malthus’s treatise on the principles of population effectively triggered the debate over the carrying capacity of the planet; it has been the role of the earth scientists that have provided a deeper understanding of the planet’s cycles of birth, development and regeneration (Dietz, Ostrom and Stern, 2006, pp. 126). However this thread also introduces the notion that anthropogenic damage to the planet could be irreversible (Hak, Moldan & Dahl, 2007, pp. 32-33). More importantly earth science establishes that the planet’s cycles are prolonged – these exist in a different time and space scale compared to the lifecycle of man; introducing the interdisciplinary subject of ‘sustainability science’ as earth science deals with the human impress upon these cycles. This scientific thread of sustainability provides some certainty to sustainability with the provision of credible facts; the scientific knowledge salience and credibility provides legitimacy to sustainability decision-making (Cash, *et. al.*, 2003).

The definitions of sustainability from this dimension are strongly focused on the life-cycle impacts and interactions between humans and the planet. The inference from this dimension of sustainability is that the well-being of the planet is closely bound to the well-being of humans (and therefore by inference all the living creatures we share the planet with). This again is very much an Aristotelian view of the world; a metaphorical expression of the dependency claim humans have upon the planet and in keeping with the philosophical assumption that posits sustainability as a state of well-being (Crisp, 2008). Definitions from this viewpoint tend to integrate the well-being of the planet together with the well-being of humans; the following examples are typical of this dimension:

“The emergence of "sustainability science" builds toward an understanding of the human-environment condition with the dual objectives of meeting the needs of society while sustaining the life support systems of the planet.”

(Turner, Kasperson, Matson, McCarthy, Christensen et. al., 2003)

“If you get right down to it, sustainability is really the study of the interconnectedness of all things”

(Barbara Lither, US Environmental Protection Agency, 2009)

“Sustainable development is maintaining a delicate balance between the human need to improve lifestyles and feeling of well-being on one hand, and preserving natural resources and ecosystems, on which we and future generations depend”.

(Global Development Research Centre, 2008)

Whilst the fundamentals of earth science are established, the interpretation of issues such as climate change (Mooney, 2008), the weather cycles (Thompkins, 2002), the use of predictive/interactive computer models (Farber, 2008), hydrology cycles (Ohmura & Wild, 2008) to name but a few are at best, hotly debated and contested within the community of earth science from experts and counter-experts (Hajer, 1995, pp. 10-11). Therefore while the scientific dimension provides some certainty – it is not absolute certainty. Regardless of the controversies within earth science, the earth scientists have become heavily relied upon to conceptualise and discern the urgency of sustainability issues; everyone from the layperson in the street to the national politician can only be educated and trust the specialist knowledge provided by earth scientists (Hajer, 1995, pp. 10).

Hajer (1995) declares that a path-dependant relationship has evolved between the earth scientists and the politicians of nation-states; the knowledge dominance of the earth scientists provides the legitimate basis for any sustainability policy decision-making (pp.10). This has led to the increasing scientification of politics; the public becomes acutely aware of this relationship during times of environmental disasters – such as the nuclear accidents of Three Mile Island and Chernobyl (Weingart, 1999). Furthermore Weingart (1999) asserts that sustainability has inadvertently led to a transformation of the relationship between politicians and scientists; not only has there been a scientification of politics but there has been a politicisation of science (pp. 153). The science thread then directly links to the political thread of sustainability.

Political Dimension of Sustainability

The political dimension is characterised by nation-states, in attempting to fulfil their obligations as set out by the Rio Declaration and later by Agenda 21 giving sustainability a substantive legal form by virtue of policy adoptions, enacted statutes and case law decisions; politicians are called upon to make practical judgements about sustainability (Doherty & de Geus, 2000, pp. 116). However the complexity of sustainability is characterised by large-scale connected systems with multiple variables; where uncertainty, conflict and multiple parties with multiple perspectives can be exacerbated with time-critical irreversibility issues (Funtowicz, Ravetz & O'Connor, 1998). The political theory developing around the concept of sustainability is at the frontier of development politics as policy-makers attempt to integrate scientific knowledge together with respect and preservation of the environment, social justice and equity of sustainability (Cash, *et. al.*, 2003).

Yet it is not enough for the policy-makers to rely solely on scientific knowledge, for sustainability also embraces economic and social aspects and therefore in its broadest sense, sustainability could also be considered to be a social science (Goffman, 2005). It is from this perspective that nation-states have taken a reductivist approach to sustainability policies; attempting to break down the large-scale systems such as the environment to smaller, environmental management systems; among which are waste management, civil planning, water management and air quality.

The political dimension is not concerned with the metaphysical definitions of sustainability; rather the emphasis is that the philosophy of sustainability should drive and direct practical outcomes that place nation-states on the road to sustainable practices (adapted from Wood, 1974). Therefore the political focus is on the outcomes rather than intentions of sustainability (Hinman, 2008). The definitions of sustainability in this dimension are largely replaced within functionality discourses and positive consequences/expectations from social change; positing that sustainability is an evolutionary process.

However the political dimension is heavily reliant on the scientific dimension to provide the foundational knowledge from which to assess which political action will have the best outcome (or consequences); the inference is that all outcomes can be measured or weighed. The political dimension implies that societies can 'grow' into sustainability by using short-term and long-term policies, strategies and regulation that will favour a sustainability transition – sustainability without disruption to the social and production development; an ensured maintenance of the nation's economy (Sachs, 1999) (again reiterating the evolutionary process of sustainability).

The political dimension particularly looks at the production-consumption relationship; the root causes of unsustainable practices (without actually identifying what an 'unsustainable practice is). However sustainability in the political dimension is problematic in that it divides into two different mutually exclusive models that are quite divorced from each other yet have significant impact on the development, perception and understanding of sustainability (Caccia, 2001).

The first model determines sustainability exists as *integration* of the economy, social and environmental goals; directed at the producers. The political policies, strategies and regulations are aimed at moving the producers away from the traditional role of profit maximisation so that social and environmental elements take an equal footing. Much of this is policy-driven 'best

practice' models, with limited application of other regulative legislation methods (legislative methods such as taxation and statute tend to be very unpopular in societies and therefore nation-states use them very sparingly) (Smith, 1997, pp. 23). Definitions from the political authority viewpoint reiterate the functionality and utilitarian foundations of the political dimension – the following are examples of this type of definition.

“The Ministry of Tourism has recently published eight best practice guides targeted at tourism operators, to help them make their businesses more sustainable. They contain practical ideas and actions businesses can take, in a wide range of areas of sustainable best practice.”

(The Ministry of Economic Development, 2008)

“Sustainable consumption and production

To live within our resources, we need to achieve more with less. This requires us to change the way we design, produce, use and dispose of the products and services we own and consume.

These pages have been developed to provide insight into some of the problems associated with current patterns of consumption and production in developed countries like the UK, and the action being taken to reduce that burden and move us towards 'one planet living”

(UK Govt., 2008)

The second model determines sustainability exists as a *balance* between the environment, society and the economy; the implication being that an equilibrium exists. In this model sustainability demands that social and environmental elements must at times, take preference over the economic elements if sustainability is to be achieved. The policies, strategies and (much less) regulation in this model are aimed at the consumers of the society; primarily it focuses on the social and environmental elements and the consumption of natural resources. Definitions from this aspect of the political dimension tend to take the moral high ground, insisting that the consumer see sustainability as a social goal of society (Doherty and De Geus, 1996, pp. 116). The following example demonstrates the second model of the political thread.

“What is sustainability?

New Zealanders are taking up the sustainability challenge. It's the smart thing to do. Actions like switching off the lights when leaving a room, walking to work, and installing insulation save money, improve fitness and protect our beautiful environment. 1156 Kiwis have committed to make a difference by taking 63,652 sustainability steps in their 'Next Step' Plans.

Living sustainably means living smarter. This site will help you reduce your impact on the environment and save money, without compromising your lifestyle. You'll find useful tips on how best to use energy and water, and what to do with your rubbish”

(Ministry of Environment, 2008)

It is from this viewpoint that the definitions of sustainability from the political dimension attempt to constrain, encourage or alter behaviour (of both the producer and consumer) (IISD, 1994). Moreover there is an underlying assumption that sustainability has a Promethean nature, that political authorities will overcome any sustainability issues with human ingenuity and technological innovation (Dryzek, 1997, pp. 45; Field, 2001, pp 5).

It is also important to note that the nature of politics is also pluralistic and therefore is comprised of various domestic actors competing as to who will benefit or be harmed by any policy actions, strategies and regulation. The political authorities respond to the constraints of an electoral cycle which can only be viewed as short-term from the sustainability eye-glass (as little as 3 years in some countries and as much as 5 in others). Many countries, which in the last century, have faced increasing populations, are increasingly overwhelmed trying to provide and maintain sound health, education and economic infrastructures while responding effectively to environmental stress (Brown, Gardner & Halweil, 1997; DeSombre, 2002, pp. 17). However the critical nature of some environmental issues declares that no political authority is able to successfully address them alone and therefore has no other choice but to enter into global negotiations (Tietenberg, 2007, pp. 2). This aspect exponentially increases the complexity of the political dimension of sustainability.

The political dimension demonstrates the balancing act of the nation-states in regard to sustainability. Regardless, policy-makers are constrained by cost-benefit outcomes and public interests, and therefore often work at cross-purposes with sustainability (O’Riordan, et. al. 1997). Manzini, (1999) claims that the ultimate goal of political authorities is to re-engineer the producer-consumer relationship and do no more; the role of nation-states is primarily anthropogenically focused to protect and sustain their populations.

Academics such as Sachs, Daly and Dasgupta determine that unfortunately many nation-state policies serve to constrain, rather than promote sustainability; central to all nation-state policies is the well-being of the economy by ensuring continued economic development (IISD, 1994). Yet Dasgupta (2000) also claims that policy makers are better able to come up with decisive sustainability policies, strategies and regulation by integrating both resource and environmental economics together with earth science; this demonstrates how intimately the political dimension of sustainability is linked to the economic dimension of sustainability.

Economic Dimension of Sustainability

The next dimension of sustainability to be considered has to be the economic. The market economies of the developed countries have without doubt bought wealth and prosperity to both the individual and society by providing employment, increasing productive outputs and international trade. Nation-states have actively valued, nurtured and protected industries and corporations within legislative frameworks so that optimal economic efficiencies and productive growth are maintained; legitimising the market economy (Kelly, 1997).

A strong link exists between the economic dimension and the political dimension of sustainability. The work of the economists largely shapes any public fiscal policies that are determined by the ruling political authority; economists are largely interested in financial structures, functioning, trends and implications of market changes (Clegg & Hardy, 1999, pp. 109; Arthur, 1999). Moreover businesses constitute the elements of a functioning economy

therefore this dimension of sustainability takes two distinct expressions; one from the economist's viewpoint, the other from the business viewpoint.

It is important to note that in this dimension sustainability moves away from the earlier debate between environments versus economic development (Lele, 2000, pp. 607). However this dimension introduces the notion that sustainability can be viewed through an economic eye-glass. The economic dimension is founded on the key idea of 'capital' – the environment viewed from this aspect is just another form of capital to be used in the production of goods; natural capital (Dasgupta, 2000; Goff, 2003). Costanza and Daly (1992) defined 'capital' as "a stock that yields a flow of valuable goods or services into the future" – the distinction between natural and manufactured stock is largely irrelevant when it is embedded into the economic dimension.

If viewing this dimension from the eye-glass of the economist - Dasgupta (2000) determines that this has led to two key distinctions in the economic dimension that inform and underpin the market place. The first is where resource economists are focused on a particular (natural or manufactured) stock to the exclusion of all else to determine the economic variables of optimum harvest rates and the value of a stock in-situ (Mitchell & Brown, 1990; Escapa & Prellezo, 2003; SukSoon, SangHee & JungMoon, 2004). The resource economist posits that there is a socially optimal rate of resource capital use (Field, 2001, pp. 4.); introducing concepts such as natural resource substitution and efficiencies of resource management (Field, 2001, pp. 7). Much of this work is often called the Hartwick-Solow approach; the ability for the economy to attain a consumption constant while at the same time maintaining a non-declining capital stock (Hussen, 2004, pp. 271-272).

The second is where environmental economists focus on biotic and abiotic processes to determine the impact of economic activity on the underlying ecosystems of environment; establishing costs of things such as the purification of water in watersheds and global warming (Waughray, Lovell, Mazhangara & Mazhangara, 1998; Ruth, Coelho & Karetnikov, 2007). The environmental economists posit that there is an efficient allocation of resources that will satisfy consumption without compromising the integrity and stability of the ecological environment (Klassen & Opschoor, 1991; Common and Perrings, 1992).

It is from this viewpoint that resource economists are able to talk of stock (natural or manufactured 'capital') in terms of quantities in contrast to environmental economists who speak of the quality of stock. The work of the resource and environmental economists is readily accepted by the market place if only because any measurement of capital whether it be quantity or quality, provides a foundation to measure economic growth (or lack thereof); the inference is that economic growth is essential for a good standard of living (for humans) (Erumban, 2008).

Another less accepted dimension of economics is the dimension of biodiversity economics. Dasgupta (2000) declares that biodiversity economics is still relatively undeveloped and largely ignored by policy makers; any resource management policies, strategies or regulation often fail to incorporate the underlying biodiversity with an ecosystem. Pearce, Moran & ICUN (1994) argue that economic biodiversity fails to be of economic importance in the market place because biodiversity is not captured nor realised in economic value terms and furthermore even if it could be captured, there is no place for these values in the market place (pp. 15-16).

Daly and Cobb (1989) insist that market economics has empowered business (and by inference industry and the corporation) by the creation of a human sub-economy, which is largely built on the exploitation of natural resources (capital) and excludes significant parties

such as the biosphere, and specie biodiversity. This finding was reiterated by Orr (1991). It is from the economic viewpoint that the definitions of sustainability focused on sustaining economic growth as demonstrated by the following examples.

“Sustainable development involves devising a social and economic system, which ensures that these goals are sustained, i.e. that real incomes rise, that educational standards increase, that the health of the nation improves, that the general quality of life is advanced”

(Pearce, Markandya & Barbier, 1990).

“Sustainable development is a holistic concept, a strategy that requires the integration of economic growth, social equity, and environmental management.”..... Sustainable development aims to make global society not just better off, but better altogether”

(New Zealand Business Council for Sustainable Development, (no author), 2008).

Effectively the market economy humanises the natural environment as an anthropocentric resource and this has ultimately lead to the misplaced belief that humans exist separately from the rest of the nature. Yet this general notion about the relationship between humans and nature is not wholly unheard of nor new; it has long been a deep tradition of humans through out history to exploit the environment they live within even though it is both recognised as necessary as it is inadequate (Myllyntaus, Hares & Kunnas, 2002). It has only been since the twentieth century that the full impact of humans on the planet has began to be understood. The planet has been transformed; ecologists and environmentalists have shown that business practices extend beyond the immediate area of impact, with serious far-reaching yet unexpected consequences (McKibben, 1990). Toxic externalities leach across national borders; inflicting environmental dilemmas on neighbouring nation-states. Furthermore toxic externalities from industrial activities are particularly worrisome; for some are bioaccumulated while others are biomagnified.

The second expression of the economic dimension of sustainability is industry and business. Industry and large corporations (here-after business) acknowledge that any future they may have (albeit it is framed within the economic framework) depends largely on how it is viewed by its stakeholders. Business has long controlled the information flow to the customers, employees, and their communities they operate in and to public at large; widely accepted is the positive link between favourable business image and superior business performance (Schmidt & Pan, 1994; Margulies, 1997). However the motivations for business to pursue sustainability have moved from concern about corporate image to the strategic and competitive advantages that sustainability reporting provides (Daniels, 2006). This is yet another dimension of economic sustainability; arguably this sector of parties creates a‘smog’ of sustainability definitions; demonstrating how sustainability definitions can be corrupted.

Merging marketing of the corporate image and reputation together with sustainability, business seeks to define and establish their narrow definitions of sustainable development as universal norms. The definitions from this viewpoint are focused on sustaining business. Little

research if any, in the area of the linguistic universals of sustainability exists, however when viewing the definitions of sustainability through the eye-glass of business – it is clear that of the plethora of definitions that exist in the public domain, many have been created and broadcast by business themselves (they invariably include some reference to economic growth and the inference that there is positive relationship between business and sustainability). This reiterates the work of Whitehead (1929) – in that in creating a symbolic reference (in this instance a definition of sustainability) a perception interface arises between causal efficacy and presentational immediacy (Scott, 2003).

This creates an artifice of a sustainability reality that is grounded in economic growth but it also contributes to the confusion in defining sustainability; each business sector and in many cases each business is not shy of recasting an existing definition or amplifying or generalising a definition of sustainability to suit their own needs – which is then broadcast to their stakeholders. Coupling together sustainability and societal values is an attempt by business to legitimise the corporation's quest for profits. Societal value in this instance is measured by the impact of their products and processes and produces a sub-narrative of sustainability (Goldman, Papson and Kersey, 2003). Often the links to previous definitions are obvious - yet some are not so obvious; what is clear is that these definitions often take on a discreet yet significant life of their own.

Arguably these definitions of sustainability are the ones that are most quoted, misquoted and metaphorically used in the public domain and have invariably lead to concepts such as sustainable agriculture, sustainable business, sustainable industry, sustainable forestry and the such like. Business attempts to embed their definition of sustainability by explicitly attempting to shape the public's perceptions of sustainability while it is still in the nascent stages of development (Thompson, 2008). Each business is able to create and therefore manipulate a definition of sustainability to suit its own needs as demonstrated by the following examples.

“Sustainable development, by definition, is about the future. At Anglo American we're helping to shape that future by minimising any negative impacts of our current operations. At the same time, we're working with local communities to ensure that they benefit from our activities – now and in the years to come”

(Anglo-American Mining Company, 2008)

“Sustainable milk growth is a central theme that runs through the heart of our strategy – and means quite simply that economic growth and sustainability must run hand in hand”

(Harris, Fonterra, 2008).

The business definitions of sustainability within the economic thread of sustainability by and large fail to communicate how market economics has also bought profound ecological degradation of non-renewable natural resource systems and loss of biodiversity (Shrivastava, 1995). The beneficent influence that the market economy may have for society comes with an awareness that the relationship between business practices and the planet are not inexorably for man's good; an element that business attempts to largely ignore. Daly and Cobb (1989) argue that market economics is but an abstraction that has masked and distorted the real world;

humanising the natural environment as an anthropocentric resource rather than placing humans as a part of the greater biosphere.

What has clearly evolved from the market economy is arguably a pathway dependency; consumerism that promotes the well being of humanity is underpinned by sustainability as an evolutionary process. The market economy demands that a nation ever increases its consumption and increase its exports with an inference of an enduring good quality of life. The alternative is recession; where an overproduction of goods fills warehouses and unemployment increases. The inference is that quality of life will deteriorate. From this viewpoint the intentions and actions of sustainability can potentially and are often derailed by the threat of economic recession (Stangis, 2008).

The Indigenous People Dimension of Sustainability

Indigenous peoples across the globe have had notions of sustainable bioregional relationships for centuries; traditional knowledge that has been passed from one generation to the next that dictates a wide range of human activity that interfaces with the environment and between their communities. This is clearly another dimension of sustainability. Major, the former Director General of UNESCO said,

“The indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems, and the techniques for using and managing them that is often particular and detailed”

(Major, 2005)

However this dimension of sustainability is problematic in its application and often appears as an afterthought of sustainability. Major (2005) fails to acknowledge that there are very few societies that remain close to nature and more importantly there are even fewer places on the earth that have not been affected anthropogenically³; disrupting and disturbing the functioning of the local ecosystems (Daily, Ehrlich & Alberti, 1996). Major (2005) instead advocates an indigenous form bioregional sustainability; a holistic philosophy which advocates the organisation of societies that live closely to the inherent geographical, cultural and economic patterns of the locality they live in, for they are without doubt dependent on their surrounding natural world (Berg, 2002).

The inference from this dimension of sustainability is that a sustainable society will evolve of itself; for the people will be familiar with their territory; production would be sustained from local geographies by following the natural cycles of the region; consumers would buy only locally produced goods in seasonal cycles as they occur and the biodiversity and natural vegetation of the bioregion would be preserved (Holdgate, 1990, pp. 79; Bastedo, 1994; Dodge, 2005). Furthermore Dodge (2005) declares that there is a stronger cultural/phenomenological relationship between the environment, biodiversity and humanity when bioregional distinctions

³ Anthropogenically – caused by humans

are made; the inference is that sustainable living automatically follows because the indigenous peoples are seen as stewards of the environment (and by inference stewards of other species).

When viewed from this perspective sustainability in this dimension is in fact limited to a form of ecological, socio-economic sustainability (Tolba, 1984; Lele, 2000, pp. 230) and often coined indigenous sustainability science (Pandey, 2002). Definitions from this dimension are strongly championed by global organisations such as the United Nations and non-governmental organisations such as Landcare Research NZ; they posit sustainability as a state of 'well-being'. These definitions talk not only of the spiritual links that indigenous people have to their land, but often integrate the economic and social well-being of the indigenous people; the focus of these definitions is to sustain the indigenous people as the following examples demonstrate.

“The goal of the sustainable development program of the Arctic Council is to propose and adopt steps to be taken by the Arctic States to advance sustainable development in the Arctic, including opportunities to protect and enhance the environment, and the economies, cultures and health of indigenous communities and of other inhabitants of the Arctic, as well as to improve the environmental, economic and social conditions of Arctic communities as a whole”.

(Arctic Council, 2008)

“Maori Sustainable Development in Aotearoa-New Zealand is a term reflecting the aspirations of contemporary Maori. It describes holistic development and a strategic direction towards advancement, Maori autonomy, self-determination, the building of human and social capacity, to capitalise on opportunities in the 21st century. Achievement may be measured through improved Maori wellbeing and standards of health, increased human and social capacity, strength of cultural identity, sustainable management of natural resources, and culturally appropriate strategies for economic growth. Central to this holistic development are Maori values, a strong sense of cultural identity and purpose, and the retention and use of Maori knowledge”

(Harmsworth, 2002).

Unfortunately the dimension of indigenous sustainability faces many challenges; the most obvious is the competing value systems between the economic dimension and the indigenous dimension of sustainability. Few, if any nations would willingly move their national boundaries to match the ecological boundaries of the environment so that the natural connections between humanity and the natural world could be rediscovered (Gray, 2007). Population growth, together with urbanisation has pulled many people into lifestyles that are divorced from their traditional homes, disconnecting subsequent generations from their cultural history and their traditional lands. What has evolved is a society that is characterised by consumption rather than a sustainable bioregional relationship to the environment (Holdgate, 1990, pp. 80). Ever-mounting consumption promulgated by the market economy has re-organised traditional societies; disunited man from his natural environs and has created parallel yet competing antinomies.

The antinomy between private property and public property within the market economy dictates there can only be owners of property and not stewards of property;

demonstrating the difference in worldviews (adopted from Oppenheimer, 1953, pp. 104). The market economy determines through well-defined property rights, the rules and norms for the connection between humans and resources. However from the indigenous viewpoint the role of landownership is inconsistent and adverse to their traditional belief systems (Holdgate, 1990, pp. 82; Hanna, Folke and Maler, 1996, pp. 2).

It is from this perspective that consumption and urbanisation has made the indigenous worldview of sustainable bioregionalism outmoded and difficult to maintain; industrialisation and market globalisation supplants sustainable bioregionalism if only because the environment is viewed as 'capital' (Holdgate, 1990, pp. 83). Moore & Lewis (2000) argue that as the urbanisation (and therefore urban populations) increased – so too did the capitalist economy and international trade; for the survival of the urban population, there was no other choice (Moore & Lewis, 2000, pp. 57). What has resulted overtime was competition between urban populations and indigenous populations; the urban populations seek to exploit the land and its resources while indigenous populations seek to protect and preserve the land and its resources (Zerbe, 2005).

It is from this viewpoint that certain nations were able to exploit the trade economy more efficiently than others; particularly nations of the Northern hemisphere. The increasing trade economy resulted in these nations amassing a greater concentration of the globe's economic and political power and established the North/South divide (Gilchrist, 2007). This has adversely impacted on indigenous groups across the globe; divorced from their home lands, undermining their value systems and often reducing them to an underclass within their own countries (Krebs, 2007).

Schmookler (1993) determined that market economy has evolved to serve the individual (as a consumer) and not society (as a social community) (Schmookler, 1993, p. 63) further undermining the value systems of indigenous groups. Moreover Schmookler (1993) declares that the market economy is skewed in favour of the individual at the cost of the social community (Schmookler, 1993, p. 66) so that any attempt to preserve indigenous communities and therefore their traditional ties to the land and resources is often viewed as a necessary burden that has to be suffered by the rest of the population.

Moreover indigenous bioregionalism in the face of increasing population growth has historically led to cyclical famine (unstable food supplies) and poor population health (Evanoff, 1999). The reality of a world population that exceeds more than six billion is an increasing agricultural and production output demand that largely sidelines this thread of indigenous sustainability (Cortese, 1999).

Conclusion

This research has identified that the definitions of sustainability can be traced to different dimensions and that the dimensions for the most part, can overlap and influence each other depending on the expert knowledge required (see Figure One). The positional power of each dimension is based on information access, the right to resources and legitimacy of their decision-making however it is clear that knowledge power trumps positional power.

The paradox of sustainability definitions lies in the parties who create them and not in the issues of sustainability; this research paper shows that the sustainability definitions often do not share the same goals. However sound each party's response to sustainability seems to them, however deeply compelling their convictions about sustainability; there are other parties who hold their own concerns, with equally well-defended convictions about what is to be sustained. What sustainability has motivated is the constant questioning and continual investigation of historical practices, customary habits and moral guides of that which has been largely presumed to be the fundamental foundations and unchallengeable aspects of human society.

This research has identified that it is unlikely that a single definitive definition of sustainability will exist. The lack of a foundational knowledge undermines the theory of sustainability; leaving it largely abstract. As result the sustainability is largely determined by the power of the parties (see Table One). Arguably these traits can reduce sustainability to an oratorical concept and therefore the discourse is largely rhetorical and fragmented. Whilst the language used in sustainability is beyond the scope of this study, it is enough to note that it is often complex and unwieldy; deconstruction of the different definitions of sustainability reveals no clarity in the language and instead metaphors of sustainability are identified (adopted from Caputo, 1994, pp. 13). Clearly the value of the sustainability lies in its ability to bring together different groups in society to discuss sustainability issues.

Figure One:

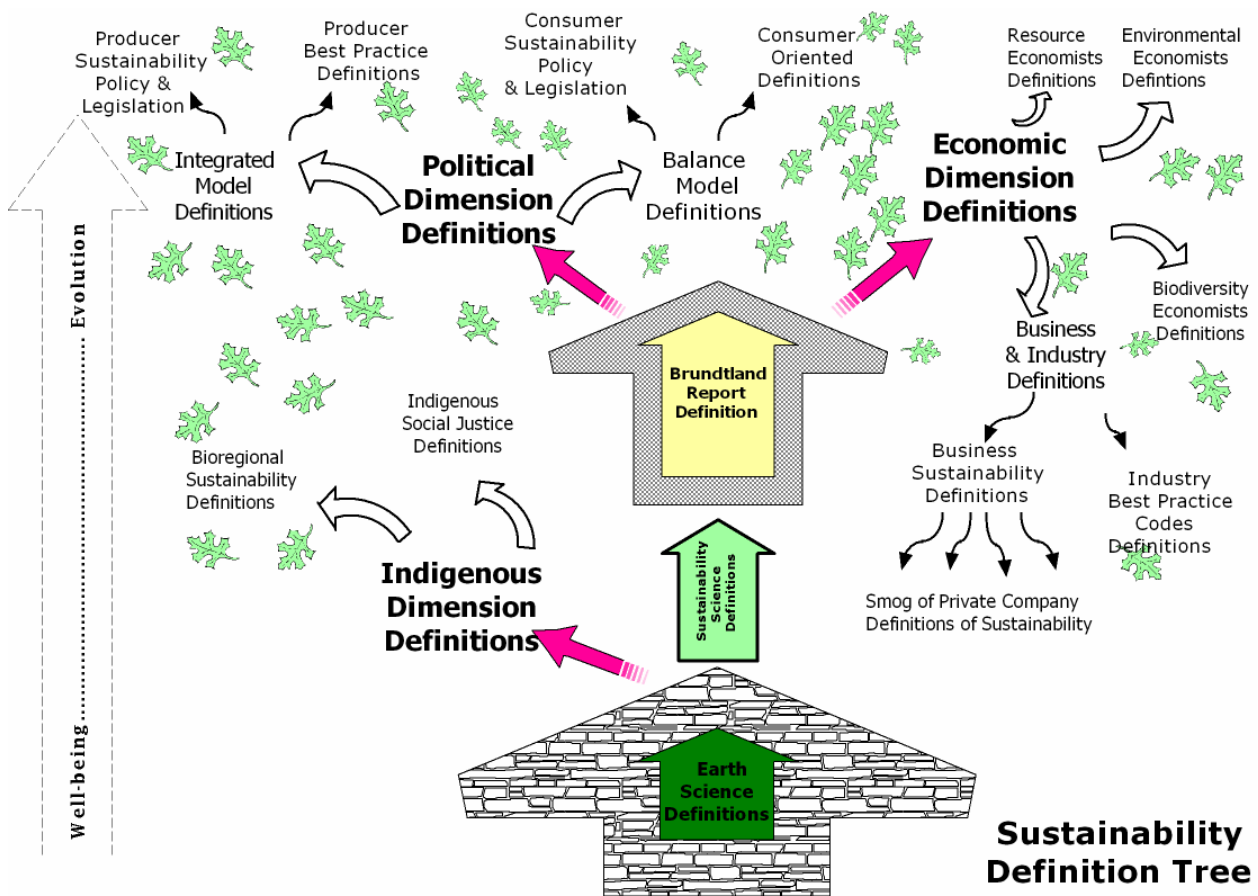


Table 1:

Sustainability Dimension		Characteristics	
Scientific Dimension	<ul style="list-style-type: none"> • Earth Science (Sustainability Science) 	<ul style="list-style-type: none"> • life-cycle impacts • interaction between humans and the planet <p><i>Definitions will contain terms such as ‘well-being of the planet’ and ‘well-being of humans’</i></p>	
Political Dimension	<ul style="list-style-type: none"> • Integration of economic, environmental and social aspects 	<ul style="list-style-type: none"> • Producer driven model <p><i>Definitions will be underpinned by ‘best practice models’ and limited application of regulation. The definitions will focus more on the efficient use of resources, reduction of waste and pollutants</i></p>	
	<ul style="list-style-type: none"> • Balance of economic, environmental and social aspects 	<ul style="list-style-type: none"> • Consumer driven model <p><i>Definitions will contain take the moral high ground – with social and environmental aspects taking precedence over economic aspects.</i></p>	
Economic Dimension	<ul style="list-style-type: none"> • Resource economic aspect 	<ul style="list-style-type: none"> • focus on stock both natural and produced (from a capital perspective) <p><i>Definitions will contain ‘optimum harvest yields’ and ‘resource substantiality’ and efficiencies of resource management (usually transcends to dollar values)</i></p>	
	<ul style="list-style-type: none"> • Environmental economic aspect 	<ul style="list-style-type: none"> • this looks at the efficient allocation of resource management that will satisfy consumption without depleting underlying natural or produced stocks (or capital) <p><i>Definitions will contain ‘quality of the resource’ and ‘integrity of the resource’ (usually transcends to dollar values)</i></p>	
	<ul style="list-style-type: none"> • Biodiversity economic aspect 	<ul style="list-style-type: none"> • looks at the biodiversity impact from economic development <p><i>Definitions will speak of impact on the underlying ecosystem , populations of species (not in dollar values)</i></p>	

<p>Economic Dimension (Cont'ed)</p>	<ul style="list-style-type: none"> • Industry & business aspects 	<ul style="list-style-type: none"> • Merges together corporate importance, marketing tools, societal values and the corporates' definition of sustainability <i>Definitions will link economic growth, societal values and a sub-narrative of sustainability that the corporation has constructed (generally by merging a plethora of other definitions to suit)</i>
<p>Indigenous Dimension</p>	<ul style="list-style-type: none"> • Bioregional sustainability 	<ul style="list-style-type: none"> • talks of the natural cycles of each regional location and couples it with consumer traits and biodiversity of the regional location <i>Definitions will contain terms such as 'buying locally' and 'sustaining the region'</i>
	<ul style="list-style-type: none"> • Indigenous groups 	<ul style="list-style-type: none"> • this identifies the cultural/phenomenological relationship between humans, the environment and biodiversity. The Indigenous groups are identified as 'stewards' of the planet and therefore existence and well-being is intrinsically linked to the 'well-being' of the planet. <i>Definitions will contain terms such as ecological preservation, well-being of the planet and species and socio-economic well-being of the indigenous groups themselves. Terms such as 'holistic development', 'protect the environment', 'spiritual attachment to the land' will be integrated with economic and social terms.</i>

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